

THE INSTITUTE OF PHYSICS

47, BELGRAVE SQUARE, LONDON, S.W.1

BULLETIN

No. 12

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DECEMBER 1950

HIGHER TECHNOLOGICAL EDUCATION

The National Advisory Council on Education for Industry and Commerce has now published its report on the Future Development of Higher Technological Education (London: His Majesty's Stationery Office. Price, 1s.). When the first draft of this report was prepared, The Institute of Physics, along with other professional institutions and similar bodies, was asked to submit comments, some of which have been accepted by the National Advisory Council and incorporated in its revised report now published.

The Board of the Institute has not yet had an opportunity to consider carefully the revised proposals, but it is felt that Members may be interested to have the comments which the Board submitted upon the earlier draft. As that draft was a confidential document the comments could not be published earlier.

COMMENTS ON THE DRAFT REPORT of the

NATIONAL ADVISORY COUNCIL ON EDUCATION FOR INDUSTRY AND COMMERCE ON

"THE FUTURE DEVELOPMENT OF HIGHER TECHNOLOGICAL EDUCATION"

1. The Board of the Institute of Physics appreciates the opportunity to submit comments upon the proposals for the future development of Higher Technological Education contained in the document, Paper T757/137. The objective of "raising the status and prestige of technological education" will, of course, meet universal acceptance but the Board cannot accept the means by which it is proposed to achieve this aim.

2. In the opinion of the Board, prestige and status of technological education cannot be raised nor be maintained merely by the establishment of a new society or institute of eminent persons; the main requirement for this purpose is the granting of adequate academic and financial freedom to the institutions charged with the task of educating technologists, as distinct from technicians. This point of view was put forward in the Institute of Physics' report, "The Education and Training of Technologists" (1948), which still represents the main lines along which the Institute considers our system of technological education should develop.

This policy is referred to again below and in the Board's view is both desirable and practicable.

3. In the following paragraphs some of the proposals made by the National Advisory Council are dealt with, but no attempt has been made at this stage to deal in detail with all the issues that are raised. The Board regrets that the Advisory Council has not considered it necessary to put forward a reasoned statement for its rejection of the major proposals of earlier reports (Percy Committee, Parliamentary and Scientific Committee, Federation of British Industries, Institute of Physics and others), but has merely put forward new proposals in a statement which on some important points is not clear.

4. The Board would have welcomed a clearer definition of the type of technologist with whose education the Council is concerned. The term itself is used by different organizations in very different senses—by some it is meant to include the highest type of industrial scientist and by others it is used to include technicians who are concerned with techniques rather than basic knowledge. It is therefore important that the category of technologist referred to in the Institute's comments should be stated.

5. In the Board's view, highly qualified *scientists* who have taken appropriate courses and obtained suitable experience are, and will remain, the "highest flight amongst technologists" (page 2 of paper T757/137) required by industry. Most of these men are at present educated by the Universities but there may be a need for additional institutions similar to the Massachusetts Institute of Technology which give a university training in science and offer post-graduate facilities of a more technical kind. The need for such "Technical Universities" must be assessed in relation to the demand for more men with *scientific* training, but the Institute believes that there is a demand now for more post-graduate facilities in Universities for special training and research closely related to industrial needs.

6. At the other end of the scale of scientific and technical training, which we might term that of the "N.C.O.'s of industry" the present facilities in this country for study leading to qualifications such as National Certificates and the Certificates of the City and Guilds of London Institute seem to the Board to

be adequate. This type of work should remain as the main function of the majority of technical colleges, which ought to continue under their present type of control.

7. There is, however, also a demand from industry for a training in which the approach is more technological than scientific but which is of higher standard than that mentioned in §6. A demarcation of this higher training from the equally important lower grades of work in technical colleges would not only help the development of the larger institutions catering for advanced work but would also assist the larger number of colleges doing the lower standard work for which the Board sees no need of awards additional to those already available and referred to in §6.

8. Our further remarks are based on the assumption that the higher type of technological training referred to in §7 is in fact that to which the Report of the National Advisory Council refers; it is the kind of training which some of our leading technical colleges have been struggling against odds to provide. It is to these colleges that the Institute directed attention in its published report; it is freedom for these colleges which the Institute urges and it is by the likely effect upon these colleges that the Institute has attempted to assess the proposals of the National Advisory Council.

9. The Colleges referred to in the Institute's Report are those which it is common to describe (in the nomenclature of the Percy Committee) as Colleges of Technology. In the Institute's view their future status and prestige depend upon their freedom from lower grade work, their academic freedom to devise their own courses and establish their own standards, their reasonable financial autonomy and (consequent upon these freedoms) their attraction of staff of high calibre. Any awards granted by such colleges would *earn* increasing recognition as these steps were taken. Initially, the majority of students would, in our view, qualify for college diplomas which would gain recognition and value as industry recognized the work which the colleges performed. Perhaps, later, some form of regional grouping of these colleges might evolve which would lead to the creation of one or more technical universities of national standing. We believe, however, that developments should not be forced but should proceed at a pace which reflects the demands of industry.

10. As the Institute believes that the central problem of the development of the existing system of technical education is the administrative, financial and academic position of the Colleges of Technology, it takes a different point of view from the National Advisory Council of the proposal to establish a Royal Society of Technology which is the main proposal of paper T757/137. The National Advisory Council appears to attach importance to this Royal Society as such and to expect desirable changes to flow from the particular functions and composition of this body. The Board of the Institute agrees that a central authority would have

important functions such as the control of the financial affairs of Colleges in a way analogous to that of the University Grants Committee, the appointment of appropriate external examiners or assessors for College examinations and the general responsibility for the maintenance of standards of awards granted by the Colleges under the auspices of the central body, but believes that even greater importance should be attached to the development of the Colleges themselves.

11. The Board also dissents from the proposal that the new central authority might recognize individual departments of colleges. This is a proposal which is counter to the fundamental aim of establishing technological institutions which are autonomous. In the Board's opinion, additional status (which, as has been stressed above, can only be *earned* and not conferred) will be created only for institutions which exist as entities, as do the Universities.

12. To summarize, the Board welcomes the stimulation of discussion which the proposals of the National Advisory Council will achieve. In so far as these proposals appear to place emphasis upon awards rather than upon the improvement of facilities, they are unacceptable to the Institute. The Board believes that the main requirement is a policy aiming at the creation of institutions with wide academic and financial freedom to undertake the type of higher technological education with which the Board understands the National Advisory Council's Report (T757/137) to be concerned. Such a policy is not only desirable but, in the Board's view, practicable and realistic. A useful beginning could be made even in the present difficult economic circumstances by the reorganization of existing facilities, without the need for an extensive building programme, and by a demarcation of higher and lower grades of work in technical colleges. This policy is hardly touched upon by the proposals of the National Advisory Council, but seems to the Board to be a logical step in the historical development of our technical educational facilities towards a new and necessary type of institution which would suit the country's particular needs.

13. The Board has not attempted to make detailed comment on some of the minor points in the proposals and it hopes that at this stage any decisions which are taken will be confined to broad questions and that further opportunities will be given to the various institutions deeply interested to give their views upon more detailed matters as they arise.

For and on behalf of the Board

F. C. TOY,

President.

E. R. DAVIES,

Honorary Treasurer.

B. P. DUDGING,

Honorary Secretary.

March, 1950.

PROCEEDINGS OF THE BOARD

The Board met on October 12 and November 16, 1950, the President, Professor W. E. Curtis, in the Chair. The following items were dealt with in addition to formal business and matters referred to elsewhere in the *Bulletin*.

Contracts of Service.—The Officers, in consultation with the Institute's legal advisers, were asked to prepare a draft of a set of notes on suitable terms of engagement for physicists to replace the existing suggested form of contract of service. It was reported that the Executive Officers receive regular inquiries from members about the suitability of contracts.

Professional Advice.—It was reported that the Officers had recently dealt with several inquiries from members which had involved advice on difficult professional problems. Advice had been given after consultation with senior Fellows having special knowledge of the particular problems or circumstances. The Board expressed its satisfaction with the present method whereby these inquiries are dealt with confidentially by the Officers and was glad to learn that the Members concerned were appreciative and satisfied.

Status of Teachers.—A report from the Education Committee concerning the status of Members teaching physics in schools was considered; this contained proposals for action that might usefully be taken by the Institute to help to improve the economic status and general conditions of teachers of physics in schools. The report was accepted and it was agreed to keep in close touch with the other professional institutions of scientists interested in this matter.

Publications.—On the recommendation of the Publications Policy Committee, authority was given for an increase in the number of pages of the journals in 1951; each journal will be increased by up to 40 pages. The format of the *Journal of Scientific Instruments*, in which the smaller war-time size of type has, so far, still been used, will be changed to be the same as that of the *British Journal of Applied Physics*.

It was agreed to commission about three more monographs in the first half of 1951 for publication in the "Physics in Industry" series. As announced in the November *Bulletin*, this series will, in future, normally be restricted to such specially commissioned books.

The Board also agreed to the Committee's proposal to publish a booklet, "Careers in Physics," which Mr. N. Clarke, Deputy Secretary, has been asked to write.

1951 Budget.—The Institute budget for 1951, submitted by the Honorary Treasurer on behalf of the Finance Committee, was agreed. The Committee had again endeavoured to make as large a provision as possible for the building up of adequate capital reserves consistent with the development of essential services to members.

The income, exclusive of a contribution from the Endowment Trust Fund towards the cost of certain specific non-professional activities, was estimated at £29,500. Expenditure for the year was estimated at £27,500 and this sum was authorized by the Board. Included in this amount was £985 for the premium of a Leasehold Redemption policy taken out to assure a sum of £40,000 in 1982 when the lease of the Institute's house expires. While allowance has also been made for increases in the printing and binding costs to allow for expansion of the journals, the Board was conscious of the continuous rise in costs of materials and printing but of course unable to make any real estimate of its magnitude. Every economy will need to be exercised if cuts in the programmes of work are to be avoided. Provision has been made for the increased work by increasing the editorial staff. (Notice of a vacant post is included in this *Bulletin*.) Almost 60% of the Institute's total expenditure will be in connection with its publication work.

Evidence of General Education.—Proposals of the Education Committee to modify the general educational requirements for membership in the light of the new General Certificate of Education were approved.

M.K.S. System of Units.—A request was made by a Member that the Board should give some guidance to teachers of physics upon the extent to which the M.K.S. system of units should be used. This was referred to the Education Committee for consideration and report.

Graduateship Examination.—The Education Committee reported that it had considered proposals for conditions and syllabuses for a Graduateship examination of the Institute and would shortly be submitting a detailed scheme.

"The scientist's ideal of the pursuit of knowledge for its own sake is as subtly pernicious as the catchword of Wilde and Whistler, 'art for art's sake.' It has a deceptive likeness to, but is in fact a flat contradiction of, the older ideal which commended the study of the humanities for humanity's sake and the study of divinity for God's sake."

LORD EUSTACE PERCY.

NOTICES TO MEMBERS

Benevolent Fund: Munificent Gift

Mr. R. S. Whipple (Founder Fellow and past Vice-President) has given a donation of £500 to the Institute's Benevolent Fund. This magnificent gift has been most gratefully accepted by the Treasurer on behalf of the Benevolent Fund Committee; it will be a great help in meeting the calls on the Fund from members and their dependants who fall on hard times, often through accident or serious illness. The Fund Committee necessarily carries on its work unobservedly and this recognition by an old friend of the Institute is a great encouragement to those who have this work at heart.

Mr. Whipple was one of the founders of the Institute and for more than thirty years has given much time, thought and practical help to its affairs in his characteristically kind and modest way; he has also recently made a donation of £100 to the Institute's "Furnishing Fund," which was established in 1947 as a means whereby members might contribute to the provision of amenities for the Institute's House.

Salary Statistics

The statistics relating to the salaries paid to Fellows and Associates, collected by the Institute in early 1948, have proved of great value to the Officers in advising members and employers and it has been decided to ask Members to supply new data in order that revised statistics may be obtained. Enquiry cards will shortly be circulated and it is hoped that a high proportion of Members will complete and return these. It is most desirable that the information obtained should be as representative of all branches of the profession as possible. All the cards returned are, of course, treated as strictly confidential documents. The details will be known only to the Institute's two senior permanent officers, Dr. H. R. Lang and Mr. N. Clarke.

After a statistical summary will be published for the information and guidance of Members and others.

Changes of Branch and Group Officers

South Wales Branch.—Dr. T. V. Starkey (Fellow), who has been Honorary Secretary of the Branch since its foundation in 1945, has been elected Chairman in succession to Professor F. Llewellyn Jones (Fellow). Mr. M. R. Hopkins (Fellow) has been elected Honorary Secretary.

North-Eastern Branch.—Mr. H. G. Yates (Fellow) has been elected Chairman in place of the late Professor G. W. Todd and joins the Board.

Industrial Radiology Group.—Mr. W. J. Wiltshire (Fellow) has been succeeded as Chairman by Mr. C. Croxson (Fellow) and Mr. W. E. Schall (Fellow) has been elected Vice-Chairman. Mr. B. N. Clack (Fellow) has become one of the Joint Honorary Secretaries in place of Dr. J. C. Chaston (Associate).

Industrial Spectroscopy Group.—Mr. E. Van Someren (Associate) has retired after being Honorary Secretary for four years and is succeeded by Mr. K. Dixon (Subscriber).

Institute's Staff Vacancy

The Institute has a vacancy for a young physicist, about twenty-five years of age, who will be required to work primarily on publications. Some industrial experience would be desirable but is not essential. The commencing salary will be between £450 and £500, depending upon the qualifications and experience of the successful candidate. The post would carry superannuation under F.S.S.U. Applications, which will be treated in the strictest confidence, should be addressed to Dr. H. R. Lang, F.Inst.P., The Institute of Physics, 47 Belgrave Square, London, S.W.1, and marked "Personal"; they should be submitted not later than December 30th.

NATIONAL CERTIFICATES IN APPLIED PHYSICS

For the first time, candidates were this year entered for the examination for the Higher National Certificate in Applied Physics. They were presented by Northampton Polytechnic, London, and four of the six candidates were successful in obtaining the award, two of them with distinction in mathematics. Eleven colleges in England and Wales presented candidates for the Ordinary Certificate and 38 candidates passed the examinations. The Institute's assessors for all the examinations for both Higher and Ordinary Certificate were the following Fellows: Mr. G. R. Noakes (physics), Mr. G. W. Warren (applied physics) and Dr. J. Topping (mathematics).

An examination for the Ordinary Certificate was, for the first time, held in Scotland. Of the seven candidates from Paisley Technical College six were successful; the Institute's assessor for all three subjects was Mr. L. W. Magson (Associate).

The following are the names of the candidates who were successful in obtaining certificates and the name of one candidate (indicated by an asterisk) who passed the examination after following an approved course for only one year and who does not, therefore, comply with all conditions for an award.

BULLETIN

ENGLAND AND WALES

Higher National Certificates in Applied Physics

Northampton Polytechnic

- H. A. Adam. J. G. Skinner (Distinction in Mathematics).
D. G. Shirley (Distinction in Mathematics). A. J. F. Trott.

Ordinary National Certificates in Applied Physics

Acton Technical College.

- R. J. Heskins. G. C. Lloyd.

Birmingham Central Technical College

L. J. Kibler.

Cardiff Technical College

- N. E. Bevan. P. I. Collier.

Harris Institute, Preston

- R. Rawcliffe. J. G. Rushton.

College of Technology, Liverpool

- A. H. Andrews. D. A. Rowell.
R. C. Bamford. F. J. Smith.
F. Baynes. R. Watkins.*
C. Corran.

South-East London Technical College

- D. C. Bull. J. W. Last.
J. Davis. C. W. Lippard.
J. W. Gientzen. A. S. Stephens.
J. E. James. D. W. Tims.
J. S. C. Large.

Northampton Polytechnic, London

- J. Auchterlonie. P. A. Hicks.
P. J. Baggs. R. E. Hines.
A. R. Firminger. I. F. Long.

Reading Technical College

- J. C. Bland. B. Jones.
J. C. Cheetham. J. Smalley.
V. E. Dyke.

Rotherham Technical College

- A. B. Collier. J. D. Lavender.
J. France.

Royal Technical College, Salford

N. MacFarlane.

SCOTLAND

Ordinary National Certificates in Applied Physics

Paisley Technical College

- J. Cowie. M. R. Porter.
F. J. Crabbe. J. Tait (Distinction in Mathematics).
J. M. Milne (Distinction in Mathematics). L. D. Wynne.

Note.—The rules approved by the two Joint Committees of the Institute and the Ministry of Education and the Institute and the Scottish Education Department differ slightly. In England and Wales no distinction mark is awardable at the Ordinary stage, but in Scotland distinction may be awarded at either the Ordinary or Higher examination.

The following is a summary of the results:—

	England and Wales Higher Certificate	England and Wales Ordinary Certificate	Scotland Ordinary Certificate
Candidates	6	64	7
Passes in—			
(i) Physics	4	52 = 81%	6
(ii) Applied physics	4	56 = 87%	6
(iii) Mathematics	6	43 = 67%	6
Passes in whole examination	4	38 = 59%	6

NEWS OF MEMBERS

Fellows

- B. A. Keen, F.R.S.—Director, East African Agriculture and Forestry Organization, Kenya, East Africa, has been appointed to the Scientific Council for Africa, South of the Sahara.
The following professional appointments have been notified:
P. Docksey—Manager, Research Station, Anglo-Iranian Oil Co. Ltd., Kirkcaldy.
V. Vand—I.C.I., Research Fellow, Chemistry Department, The University, Glasgow.

Associates

The following professional appointments have been notified:

- J. W. Blarney—Research School of Physical Sciences, Australian National University, Canberra, Australia.
V. J. Bosher—Senior Scientific Officer, Long Range Weapons Establishment, Adelaide, Australia.
G. C. Curtis—Research Assistant, Physical Chemistry Department, King's College, Newcastle-upon-Tyne.

- A. F. Howatson—Physicist, Research Department, Royal Cancer Hospital, Glasgow.
H. R. L. Lamont—Senior Lecturer in Electronics, The Royal Technical College, Glasgow.
A. C. Moore—Scientific Officer, Telecommunications Research Establishment, Malvern.
E. H. Rhoderick—Research Associateship, Columbia University, New York, U.S.A.
J. H. Sanders—Demonstrator, The University of Oxford.
J. W. Sharpe—Lecturer in Natural Philosophy, Royal Technical College, Glasgow.
J. S. Thorp—Physics Laboratory, Research Department, Metropolitan-Vickers Electrical Co. Ltd., Manchester.

Graduates

- The following professional appointments have been notified:
G. G. Miller—Physicist, Courtauld's Ltd., Coventry.
P. B. Wallis—Fuel Research Section, Babcock and Wilcox, Ltd., Renfrew.

"Education means many lesser things but it also means that the student should be led to the place in which he can begin to see the meaning of life, the relation of himself to reality: a place in which he can lay the foundations of his character and discover the principles of decision and the canons of conduct by which he will guide his life."

GEORGE B. JEFFERY.

THE INSTITUTE OF PHYSICS

THE REGISTER

ELECTION TO MEMBERSHIP

Fellows

(*) indicates transfer from Associateship.

- *Gridley, Maurice Robert, B.Sc., Head of Science Department, Mid-Essex Technical College, Chelmsford.
- *Kington, Reginald Sifton Thompson, B.Sc., Officer-in-Charge, Timber Physics Section, Division of Forest Products, C.S.I.R.O., Australia.
- *Sharpe, John Walker, M.A., Research Physicist, Imperial Chemical Industries Ltd., Runcorn.

Associates

(*) indicates transfer.

- *Ahlers, Norman Herbert Edgar, B.Sc., Spectroscopist, Paint Research Association, Teddington, Middlesex.
- *Bell, Joseph Charles, B.Sc., Physicist, Optics Department, Hilger & Watts Ltd., London.
- Bennett, Herbert William, B.Sc., Physics Lecturer, College of Technology, Leicester.
- Davison, George Robert, B.Sc., Research Engineer, Pametrada Research Station, WallSEND.
- Dennis, William Lionel, B.Sc., Senior Experimental Officer, Chemical Defence Experimental Establishment, Porton.
- Hu, Pak Mi, B.A., Ph.D., Senior Demonstrator in Physics, Hong Kong University.
- *Light, Leon Henry, B.Sc., Research Scientist, Mullard Radio Valve Co., Mitcham Junction, Surrey.
- *Lindop, Tony William, B.Sc., Development Physicist, W. Edwards & Co. (London) Ltd.
- Palmer, George Henry, M.Sc., Head of Science and Related Mathematics Dept., Aston Technical College, Birmingham.
- *Parker, Arthur Bernard, B.Sc., Ph.D., Research Physicist, Crompton Parkinson Ltd., Swansea.
- Sheriff, Ibrahim Ibrahim Aly, M.Sc., Research Student, Chelsea Polytechnic, London.

Graduates

(*) indicates transfer.

- Adam, Herbert Alexander, Research Assistant, Associated Electrical Industries Research Laboratory, Berkshire.
- Bartlett, Brian Mervyn, B.Sc., Assistant Geophysicist, Department of Mines, South Australia.
- Copley, Christian Henry, B.Sc., Assistant Teacher, Hendon Technical College, Middlesex.
- Cunningham, Frederick Paulinus, B.A., Physics Master, Douai School, Reading, Berkshire.
- *Fullick, Alfred Anthony Alexander, B.Sc., Research Student, University College, London.
- *Gayther, Derek Bathurst, B.Sc., Research Student, The University, Manchester.
- *Geake, John Edward, B.Sc., Research Student, University of Manchester.
- Hampson, Brian Harry, B.Sc., Physicist, Lever Bros. & Unilever Ltd., Port Sunlight.
- Kelly, Anthony, B.Sc., Research Student, Cavendish Laboratory, Cambridge.
- Knapp, Peter Edwin, B.Sc., Lecturer, Northampton Polytechnic, London.
- *LeMeurier, Robert Justin, B.Sc., Research Officer, C.S.I.R.O., Australia.
- McCabe, John James Colin, B.Sc., Junior Science Master, St. Mary's College, Middlesbrough.
- Nicholls, Joan Frances, B.Sc., Senior Research Assistant, Kodak Ltd., Harrow, Middlesex.
- Owen, Gwilym Elian, B.Sc., Research Physicist, Dunlop Rubber Co. Ltd., Birmingham.
- Rose, Raymond Paul, B.Sc., Physicist, Standard Telephones & Cables, Ltd., London.
- Scragg, Sidney, B.A., Research Physicist, Imperial Smelting Corporation Ltd., Cheshire.
- *Shuttlewood, George Douglas, B.Sc., Scientific Officer, Royal Aircraft Establishment, Farnborough, Hants.
- Skinner, Lois Madeleine, B.A., Scientific Officer, Telecommunications Research Establishment, Great Malvern.
- *Smallwood, Stanley Evan Frederick, B.Sc., Experimental Assistant, Research Laboratories of the General Electric Co. Ltd., Wembley, Middlesex.

Smith, Michael Samuel, B.Sc., Physicist, Automatic Telephone & Electric Co. Ltd.
Trott, Alan John Francis, Research Assistant, Associated Electrical Industries Research Laboratory, Aldermaston, Berkshire.

Subscribers

Horne, William Arthur, Corporation of Glasgow.
Leitch, Matthew Blackwood, Western Regional Hospital Board, Glasgow.
Plummer, Reginald Stephen, Atkins, Robertson & Whiteford Ltd., Glasgow.
Piercey, Malcolm Richard, The English Electric Co. Ltd., Rugby.
Powell, Denis, Bacteriology Department, University of Edinburgh.
Proctor, Kenneth Albert, Boots Pure Drug Co. Ltd., Nottingham.
Stewart, Mary Charlotte, Corporation of Glasgow.

Students

Aldous, Graham Allan, Borough Polytechnic, London.
Avery, Thomas, College of Technology, Manchester.
Barber, Gordon Joseph, Woolwich Polytechnic, London.
Barlow, Arthur Edward, Royal Technical College, Salford.
Baylis, Geoffrey Noel, Royal Technical College, Salford.
Beattie, John Mackay, University of Glasgow.
Bell, Peter Brown, University of Glasgow.
Bingham, Jane Alexander Craig, University of Glasgow.
Cairnie, Alan Bruce, University of Glasgow.
Cairns, Robert Thain, University of Glasgow.
Cochrane, Archibald Jeffrey, Royal Technical College, Glasgow.
Cook, Geoffrey Michael, University of Glasgow.
Cooke, Ian, University of Glasgow.
Crawford, George Ian, University of Glasgow.
Davey, Mary Ross, University of Glasgow.
Deeprose, Derrick George, University of Manchester.
Dick, Dorothy Morrison, University of Glasgow.
Eglington, Anthony Joseph, University College, London.
Fagan, George Atkinson, King's College, Durham.
Firminger, Alan Robin, Northampton Polytechnic, London.
Fordyce, James Kennedy Fergusson, University of Glasgow.
Gowler, Edmund John, University of Glasgow.
Grant, Alastair Ian, University of Glasgow.
Hastings, Bernard Ratcliffe, University of Glasgow.
Hicks, Peter Alan, Northampton Polytechnic, London.
Hunter, Norman John, University of Glasgow.
Innes, John Falconer, University of Glasgow.
Isotta, Noel Ettore Coldrey, Chelsea Polytechnic, London.
Jeffrey, Stewart Duncan, University of Glasgow.
Johnston, Gordon Hounston, University of Glasgow.
Jolly, Joseph Hixon, University of Glasgow.
Kirkhope, James, Royal Technical College, Glasgow.
Kirwan, Charles Belton, Royal Technical College, Glasgow.
Lello, Brain Dennis Nodes, Acton Technical College, London.
McCubbin, William Lorimer, University of Glasgow.
MacLean, V. Noel, University of Glasgow.
MacLeod, Angus James Miller, Royal Technical College, Glasgow.
McNeill, Ian Cameron, University of Glasgow.
McTernan, Allen James, University of Glasgow.
Mitchell, William King, University of Glasgow.
Moffatt, Robert, University of Glasgow.
Morton, William Taylor, University of Glasgow.
Neville, Robin Sinclair, Royal Technical College, Glasgow.
Orchard, Stanley Ernest, King's College, Durham.
Parker, Norman Stanley, King's College, Durham.
Peacock, Nicol Jamieson, University of Glasgow.
Preston, Ian Matheson Hamilton, University of Glasgow.
Randall, Denis David, University College, Southampton.
Ray, Rabindra Nath, Royal Technical College, Glasgow.
Read, William Edmund, Borough Polytechnic, London.
Russell, John Logan, University of Glasgow.
Shields, James, University of Glasgow.
Taylor, Derek Edmund, Royal Technical College, Salford.
Udall, James Bryan, Royal Technical College, Salford.
Verow, Graham William, King's College, Durham.
Walker, Kenneth Alexander, University of Glasgow.
Willis, Vincent, King's College, Durham.
Woodcock, Norman Edgar, King's College, Durham.
Wright, John Evelyn, Woolwich Polytechnic, London.
Young, William, University of Glasgow.

APPOINTMENTS VACANT

(See also page 4)

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

Physicists and Electrical Engineers are invited to apply for following unestablished appointments in Scientific Officer Class at a Ministry of Supply Research and Development Establishment in the South Midlands.

Principal Scientific Officers

1. To lead a team in electronics research with special reference to microwave techniques.

2. To lead a team engaged on development of fire control radar equipment. Considerable experience of either radar equipment, servo mechanisms or of general electronics is essential.

Candidates for these posts should be at least 31 years of age, possess an honours degree or equivalent in physics or electrical engineering and show evidence of a good record of individual research and development work and of administrative ability.

Scientific Officers (2 Posts)

For research and development work on Army radar equipment. Candidates should have a good honours degree in physics or electrical engineering with an interest in electronics or microwave techniques. Salaries according to age, qualifications and experience within ranges:—

Principal Scientific Officers	£960-£1,295
Scientific Officers	£380-£620

Posts carry F.S.S.U. benefits. Rates for women somewhat lower.

Application forms obtainable from Ministry of Labour and National Service Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting A.296/50A. Closing date December 24, 1950.

Required young honours graduate in engineering with, if possible, some practical experience in electronics, or Physicist with some practical knowledge of spectroscopy. Initial salary in the range £375-£500 according to qualifications and experience. Permanent employment carries admission to F.S.S.U. Apply with full particulars age, education, qualifications and experience to Director, British Electrical and Allied Industries Research Association's Laboratories, 5 Wadsworth Road, Greenford, Middlesex.

Ministry of Supply invites applications from Electronic Engineers and Physicists for unestablished appointments in the Scientific Officer and Experimental Officer classes at the Royal Aircraft Establishment, Farnborough, particularly in the fields of Radio Communications, including microwave techniques, circuit design and measurements, servo mechanisms and measurement of flight parameters.

- (1) **Scientific Officer Class.** Candidates must have a good honours degree in appropriate subject or equivalent qualifications. At least three years post graduate research experience required for Senior posts. Grade and salary to be assessed according to age, date of graduation and experience within following ranges: Senior Scientific Officer (min. age 26) £670-£860; Scientific Officer £380-£620. Rates for women somewhat lower. Posts carry F.S.S.U. benefits.
- (2) **Experimental Officer Class.** Minimum qualification is Higher School Certificate with mathematics or a Science subject as a principal subject, but candidates with other qualifications, such as Higher National Certificate in electronics or light electrical engineering, or a pass degree in physics, are invited to apply. Appropriate experience is required for senior posts and would be an advantage for all appointments. Grade and salary to be assessed according to age, experience, etc., within following ranges: Senior Experimental Officer (minimum age 35) £705-£895; Experimental Officer (minimum age 28) £495-£645; Assistant Experimental Officer £220-£460. Rates for women somewhat lower.

Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting D.220/50A. Closing date December 24, 1950.

Physicists and/or Engineers are offered progressive posts to undertake research on the processes and machines used in manufacturing felts. The work will be directed at developing felting machinery and will involve academic studies of mechanical felting treatments and the study of existing machinery under production conditions. Candidates should preferably be within the age range of 21 to 26 years, although older candidates will be considered. The minimum qualification required is a second-class honours degree in physics or engineering. The salary scale offered is £425 × £25 to £650 p.a., with superannuation under F.S.S.U. Apply by personal letter to:—The Director, The British Hat and Allied Feltmakers Research Association, Stanley House, Manchester Road, Fairfield, Manchester.

Applications are invited by Ministry of Supply from Electronic Physicists and Engineers for unestablished appointments in the Scientific Officer Class at Research and Development Establishments mainly in the South of England.

Candidates should have a good honours degree in physics or light engineering. Post-graduate research, or experience in a technical branch of H.M. Forces, or in industry, in some aspect of electronics would be an advantage. Candidates for the senior grade should be at least 26 years of age and have had not less than 3 years post-graduate research experience.

Salary according to age, qualifications and experience within ranges (male):—

Senior Scientific Officer	£700-£900 (London)
	£670-£860 (Provincial);
Scientific Officer	£400-£630 (London)
	£380-£620 (Provincial);

Posts carry benefits of F.S.S.U. Rates for women somewhat lower.

Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting A.311/50A. Closing date December 24, 1950.

Applications are invited by the Ministry of Supply from Physicists and Electronic Engineers for unestablished appointments in the grade of Senior Scientific Officer or Scientific Officer at a research establishment near London.

- (1) Electrical Engineer qualified in radio communications with an interest in the engineering of development prototypes.
- (2) Physicist with interest in the application of electronic techniques to the solution of physical problems.
- (3) Physicist for work on the application of electronic methods to photography of detonation phenomena.
- (4) Physicist for experimental research on the effect of blast; good mathematical knowledge required.

Candidate should possess an honours degree or equivalent in physics or electrical engineering. For the senior grade the minimum age is 26 and at least 3 years post-graduate research experience is required.

Salary according to age, qualifications, experience, etc., within the ranges Senior Scientific Officer (Male) £670-£860
Scientific Officer (Male) £380-£620.

The posts carry F.S.S.U. benefits. Rates for women somewhat lower.

Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting A.313/50A. Closing date December 24, 1950.

Physicist required for interesting work involving the testing of materials and investigating the properties of new materials and their applications to a wide range of engineering products. Qualifications degree in physics or equivalent with some experience in this type of work. Applicants should write giving full details of experience and qualifications to Personnel Department, E.M.I. Engineering Development Ltd., Blyth Road, Hayes, Middlesex, quoting ED/29.

Physicist required for interesting work on cathode ray tube development. Qualifications degree in physics or equivalent with some experience of vacuum physics. Age 23-30. Applicants should write giving full details of experience and qualifications to Personnel Department, E.M.I. Engineering Development Ltd., Blyth Road, Hayes, Middlesex, quoting ED/28.

THE INSTITUTE OF PHYSICS

Electronic Engineers and Physicists are invited by the Ministry of Supply to apply for unestablished appointments in the Experimental Officer Class at Research and Development Establishments in and near London.

Minimum qualification Higher School Certificate: applications also invited from candidates holding Higher National Certificate in light engineering, including electronics, or higher qualifications. Experience in the following fields is desirable: electronic measurements in connection with field trials; radio and electronic circuitry; high speed electrical transients; electronic development; general experimental research requiring some mathematical facility.

Salary according to age, qualifications and experience within ranges:—

Experimental Officer (minimum age 28)

£525-£675 (London).

£495-£645 (Provincial).

Assistant Experimental Officer

£230-£490 (London).

£220-£460 (Provincial).

Rates for women somewhat lower.

Application forms obtainable from Ministry of Labour and National Service Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting A.294/50A. Closing date December 24, 1950.

Applications are invited from Physicists for unestablished appointments in the Scientific Officer Class at Ministry of Supply Research and Development Establishments mainly in South of England. The appointments cover a wide range of research and development in fundamental and applied physics.

Candidates should have a good honours degree in physics. Research experience, academic or industrial, would be an

advantage. For the senior grade candidates must be at least 26 years of age, and have had not less than 3 years post-graduate research experience.

Salary according to age, qualifications and experience within ranges (male). Senior Scientific Officer £700-£900 (London);

£670-£860 (Provincial);

Scientific Officer £400-£650 (London);

£380-£620 (Provincial);

Posts carry benefits of F.S.S.U. Rates for women somewhat lower. Application forms obtainable from Ministry of Labour and National Service Technical and Scientific Register (K), York House, Kingsway, London, W.C.2, quoting A.310/50A. Closing date December 24, 1950.

Physicists are invited to make application for unestablished appointments as Senior Scientific Officers or Scientific Officers in a Ministry of Supply Research Establishment in London for the handling of radioactive materials.

Candidates must have an honours degree in physics and preferably have had experience in designing electronic equipment and D.C. amplifiers.

For S.S.O. appointments candidates must be at least 26 years of age and have had at least three years post-graduate research experience.

Salary according to age, date of graduation and experience within ranges:—

Senior Scientific Officer

£700-£900.

Scientific Officer

£400-£650.

Posts carry F.S.S.U. benefits. Rates for women somewhat lower. Application forms obtainable from Ministry of Labour and National Service Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting A.295/50A. Closing date December 24, 1950.

DIARY OF INSTITUTE MEETINGS

Members may bring guests to any of the meetings listed below unless otherwise indicated. Individual notification has been or will be sent to the members of the Branch or Group concerned. Other members of the Institute may obtain further particulars from the Secretary of the Institute.

Tuesday, December 12th (London and Home Counties Branch), at 5.30 p.m., at the Middlesex Hospital Medical School, Ridinghouse Street, London, W.1. "Physics in the Hospital and Medical School." Short papers will be read by Professor J. E. Roberts, F.Inst.P., Dr. J. F. Tai, A.Inst.P., Mr. G. H. Haggis, and Mr. J. W. Tappin. Admission will be by ticket only, application for which should be made to the Deputy Secretary of the Institute as early as possible.

Tuesday, December 12th (Scottish Branch), at 7.0 p.m. in the Natural Philosophy Department, The University, Glasgow. Mr. W. D. Oliphant, F.Inst.P. (Ferranti Ltd.). "Vacuum Physics."

Tuesday, December 12th (Electronics Group), at 5.30 p.m. at the Institute's House, 47 Belgrave Square, London, S.W.1. Dr. T. Kilburn (University of Manchester). "Electronic Digital Computers."

Thursday, December 14th (Midland Branch), at 5.0 p.m. at the University, Edmund Street, Birmingham. Dr. H. L. Penman, F.Inst.P. (Rothamsted Experimental Station). "Some Physical Aspects of Plant Growth."

Tuesday, January 16th (Electronics Group), at 5.30 p.m. at the Institute's House, 47 Belgrave Square, London, S.W.1. Mr. R. W. Douglas, F.Inst.P. (Research Laboratories of the General Electric Co. Ltd.). "Some Aspects of Semi-conductors."

Friday, January 19th (North-Eastern Branch), at 7.0 p.m. in the Physics Lecture Theatre, King's College, Newcastle-upon-Tyne. Dr. W. F. Berg, F.Inst.P. (Research Laboratory, Kodak Ltd.). "The Mechanism of Photographic Latent Image Formation."

Monday, January 22nd (Manchester and District Branch), at 6.15 p.m. Joint Meeting with the Institution of the Rubber Industry in the Engineers' Club, Albert Square, Manchester. Mr. E. F. Powell (Dunlop Rubber Company). "The Application of Physical Techniques in the Rubber Industry."

Wednesday, January 24th (South Wales Branch), at 5.30 p.m. at University College, Cardiff. Dr. L. R. G. Treloar, F.Inst.P. (British Rayon Research Association). "The Physics of Rubber and High Polymers."

Wednesday, January 24th (London and Home Counties Branch), at 5.30 p.m. Private Meeting to be held at the Royal Society of Tropical Medicine and Hygiene, Manson House, 26 Portland Place, London, W.1. Professor Kathleen Lonsdale, F.R.S. (University College, London), and Professor N. F. Mott, F.R.S., F.Inst.P. (University of Bristol). "Ethical Problems of a Physicist." This meeting is confined to members of the Institute only. Admission will be by ticket, application for which should be made to the Deputy Secretary of the Institute as early as possible.

Tuesday, February 6th (Scottish Branch), at 7.0 p.m. in the Natural Philosophy Department, The University, Glasgow. Dr. E. C. Bullard, F.R.S. (National Physical Laboratory). "Seismology at Sea."

Wednesday, February 7th (Scottish Branch), at 7.0 p.m. in the Natural Philosophy Department, The University, Drummond Street, Edinburgh. Dr. E. C. Bullard, F.R.S. (National Physical Laboratory). "Seismology at Sea."

Saturday, February 10th (South Wales Branch), at 2.0 p.m. at Swansea. Mr. T. A. Eames, F.Inst.P. (British Railways Research Department). "Physics in Railway Research."